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Roscoe / Winnebago Elec. Brake
Ground Water Monitoring

TCE Groundwater Contamination in the Roscoe Area
Winnebago County, Illinois
U. of I. Contract No. 1-5-39636
Progress Report
September 15, 1983

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A meeting was held July 1, 1983, to gather the principals involved in different aspects of the project. In attendance were Sherry Otto, IEPA, Springfield; Bob Wengrow, IEPA, Rockford; Roger Ruden, Illinois Department of Public Health (IDPH), Rockford; Mike Bacon, Winnebago County Public Health Department (WCPHD); and Allen Wehrmann, ISWS, Champaign. The results of groundwater analyses collected, their relation to what was known about the geology and hydrology of the area, and the tentative placement of monitoring wells was discussed. Ms. Otto expressed regret that the IEPA rig would not be available until the end of July because of previous commitments at other sites.

It was decided that in response to a pledge of support from area drillers, an attempt would be made to drill several temporary wells north of the contaminated subdivision to see if the contamination plume could be delineated prior to placement of the permanent monitoring wells. Assistance for drilling the temporary wells was coordinated through Jerry Rosenquist, a local driller. Drilling commenced on July 18. A total of 5 wells were placed and sampled at depths of 40 and 50 feet. The wells were placed around the perimeter of a field located just north of the affected subdivision (MAP 1) where groundwater quality had never been determined.

Results of the temporary well samples are shown on the attached map. No clear cut plume was defined with these wells but a few trends were seen. Most obvious were the results of sampling at 40 and 50 feet just across Hononegah Road from the affected subdivision (TP-1). Only 18 and 84 ppb TCE were found at 40 and 50 feet, respectively. However, a home

supply well (depth -65 feet) sampled that same week contained over 2000 ppb TCE. This would appear to be the result of the TCE having moved down through the upper surface of groundwater, possibly as a result of its greater density (1.5 x water). A general trend of increasing concentrations northward along Route 251 is also apparent.

Construction of the permanent wells commenced August 8. Nine wells were constructed of 2-inch diameter stainless steel at the location and depths shown on MAP 2. The wells were generally nested in pairs except for the three-well nest just north of the subdivision. Because samples at 40 and 50 feet taken from the temporary well at this location did not reveal large concentrations of TCE (see TP-1 on first map), it was believed deeper wells would. It was also hoped that the deepest extent of the TCE plume could be distinguished.

Two weeks later, the week of August 29, groundwater level measurements and a preliminary round of samples were collected from each well. In addition, the elevation of each well casing was determined so groundwater elevation contours could be drawn. Groundwater elevations from the monitoring wells are shown in table 1.

Table 1. Groundwater Elevations in ISWS/IEPA Monitoring Wells, August 30-31, 1983

<u>Well I.D.</u>	<u>Groundwater Elevation (feet MSL)</u>
N1-60	717.40
N1-70	717.41
N1-80	717.34
N2-50	722.07
N2-60	722.08
N3-40	720.87
N3-55	720.88
N4-50	721.91
N4-60	721.89

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The groundwater contour map is shown as MAP 3. The contours indicate groundwater movement is from northeast to southwest, conforming with contours produced in our previous investigation of nitrates in groundwater (ISWS Contract Report 325).

The results from samples collected from the monitoring wells are summarized in table 2. The largest concentration of TCE, 1112 ppb, was found at 60 feet in Nest 1, just north of Hononegah Country Estates subdivision. TCE concentrations fell off considerably at 70 and 80 feet, to 460 and 281 ppb, respectively. The wells at Nest 4 show higher amounts with 829 and 402 ppb at 50 and 60 feet, respectively. The results at these wells and at Nests 2 and 3 indicate:

- 1) The movement of contaminants is not as two-dimensional as hoped. A controlling factor in the spread could be hydraulic conductivity with "fingers" of higher concentrations moving on paths of higher conductivity.
- 2) The contamination source(s) may be spread out over a fairly large area and we may actually be monitoring more than one plume. More importantly, the timing and release rate of pollutants to the groundwater is probably not constant. As found with the nitrate study, surface and near-surface contaminants are washed downward during groundwater recharge events, and the timing and size of the event can have a great effect on contaminant release.

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Table 2. Sampling Results, ISWS/IEPA Monitoring Wells
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<u>Well I.D.</u>	<u>TCE concentration (ppb)</u>
N1-60	1,112
N1-70	460
N1-80	281
N2-50	43
N2-60	293
N3-40	267
N3-55	59
N4-50	829
N4-60	402

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Further work is contemplated to investigate these two areas. Within the next two weeks, pressure tests will be conducted to determine the hydraulic conductivity at each monitoring well. Depending on time constraints, additional data may be collected on the monitoring wells constructed by Warner Electric, just upgradient of our monitoring wells. Incidentally, focus is being concentrated on Warner as samples collected in residences upgradient of their property have not contained appreciable amounts of TCE.

Monitoring wells constructed by Warner Electric have been placed across the entire extent of their property; results of sampling these wells should provide some insight as to where contamination may have originated. Correspondence is continuing on documenting the occurrence of spills at Warner, the construction of their lagoons, and the amounts of solvent used and possibly discharged at Warner. Samples from Warner are now being jointly collected by IEPA and Warner personnel to be sent to their respective laboratory facilities. For consistency, the IEPA has agreed to send their samples to the IDPH lab (Chicago) where all other samples, to date, have been analyzed. Much more water quality data needs

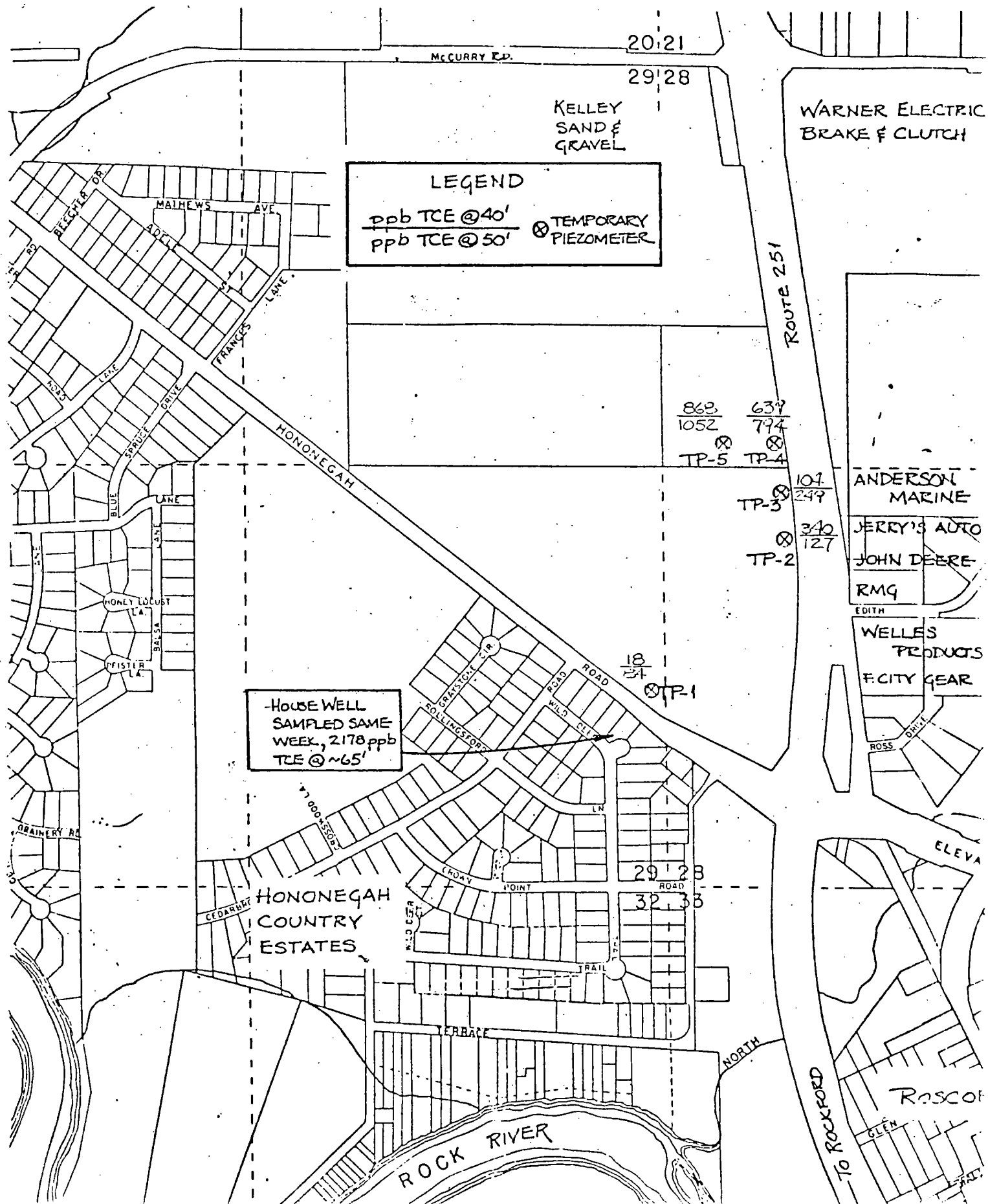
to be gathered to allow duplication through modeling efforts. Once duplication (verification) has been completed, modeling of past events and possible future restoration endeavors can be conducted.

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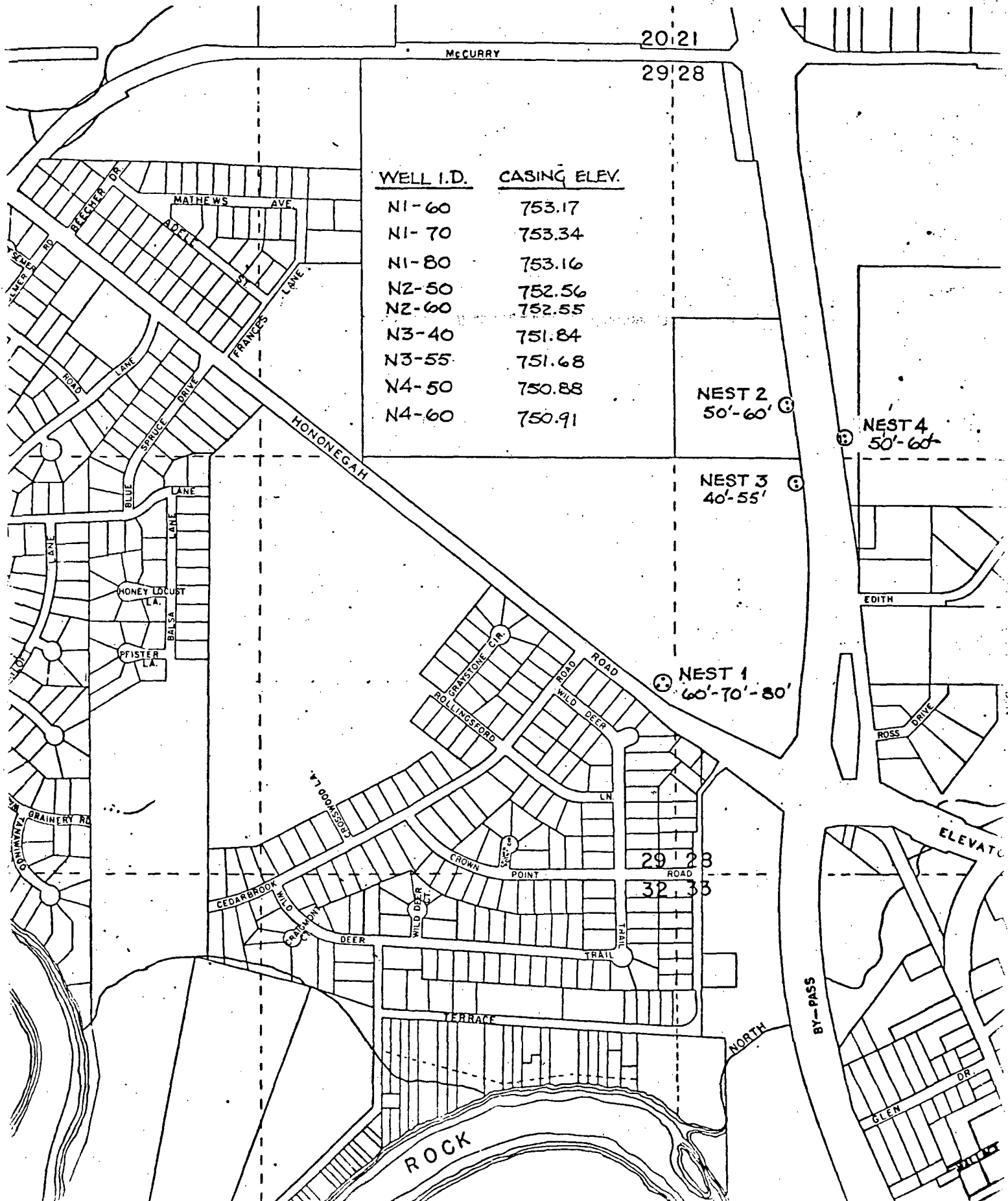
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MAP 2. LOCATION OF ISWS/IEPA MONITORING WELLS ROSCOE, ILLINOIS

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MAP 3. GROUNDWATER ELEVATIONS
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